Talbot and J. W. Brown, and forms part of vol. xli. of Smithsonian Miscellaneous Collections. The same volume contains a compilation of the statistics of the chemical societies of the world for the year 1900, by Dr. H. C. Bolton.

According to a new patent of the Chemische Fabrik Griesheim-Elektron, lead dioxide is now produced electrolytically from a solution of an alkali chloride in which litharge is suspended. The dioxide is formed at the anode by the action of nascent chlorine and sodium hypochlorite on the sodium plumbite produced from the litharge and the sodium hydroxide set free at the kathode. No loss of chlorine takes place at the anode during this electrolytic process.

Vol. xxxvii. of the *Proceedings* of the American Academy of Arts and Sciences contains the results of an investigation of the decomposition of mercurous chloride by dissolved chlorides, by Messrs. T. W. Richards and E. H. Archibald. It is shown that this decomposition is quite considerable if the chloride solutions are fairly concentrated, a point of considerable importance in the analytical determination of mercury as mercurous chloride. The action is not of a catalytic nature, but a definite condition of equilibrium is set up, the dissolved mercury existing probably in the form of a complex ion represented by the formula $HgCl''_4$ in the solution.

While admitting that the evidences of embryology, vestigial traces, and geographical distribution have rendered it indisputable that species have arisen in our world, not through creation in each fresh case, but through descent from other kindred species with variation, Mr. James B. Johnston maintains, in an article "What About Natural Selection?" in the *Contemporary Review* for July, that the proved influence of natural selection is being written down as less and less every day. The article is concerned only with the evidence of palæontology.

The additions to the Zoological Society's Gardens during the past week include a Vervet Monkey (*Cercopithecus lalandii*) from South Africa, presented by Mr. J. M. Hemingway; an African Tantalus (*Pseudotantalus ibis*) from West Africa, presented by Mr. C. T. Reaney; two Black Salamanders (*Salamandra atra*), an Alpine Newt (*Molge alpestris*) from the Alps, presented by the Rev. J. W. Horsley; a Common Viper (*Vipera berus*) British, presented by Mr. E. Ball; a Chacma Baboon (*Cynocephalus porcarius*), a Natal Sternothere (*Sternothoerus sinuatus*), from South Africa, a Ludio Monkey (*Cercopithecus ludio*) from West Africa, two Grey Lemurs (*Hapalemur griseus*) from Madagascar, two Azara's Opossums (*Didelphys azarae*) from La Plata, a Botta's Snake (*Charina bottae*) from North America, deposited.

OUR ASTRONOMICAL COLUMN.

Changes on the Moon.—The June number of the *Century Magazine* contains a popular account of the observations of the moon made by Prof. W. H. Pickering at Flagstaff, Arizona, and Jamaica, illustrated with pictures from drawings and photographs. Previous workers have already shown that some markings on the lunar surface were in all probability of a variable nature, but the new observations demonstrate beyond doubt that the surface of the moon is subject to distinct changes, and Prof Pickering gives some very decisive instances where radical alterations have actually been observed. Attention also is drawn to the existence of seas, canals and lakes on our satellite's surface, terms which have very generally been adopted with reference to the planet Mars, but which are employed here with the full understanding that they do not imply in any way the existence of water in the liquid form. These canals are described as being smaller than those on Mars, but broader in proportion to their length; in colour they are grey and yellowish-white. Many of the changes on the lunar surface are caused by the growth, as Prof. Pickering states, of the lunar vegetation itself, and he quotes a particular region situated just to the right of the central peaks of Eratosthenes where he observed the most marked change; reference is further made in some detail to the changes observed in some of the canals and lakes. The importance of these observations to selenography and the great interest attaching to them should undoubtedly stir up a new desire in many workers to follow and continue these researches, which require no very great instrumental equipment.

Remarkable Naked eye Nebulosity.—Mr. W. H. Robinson, writing from the Radcliffe Observatory, Oxford, sends us a description of a curious object observed by him on May 28. Whilst observing with the Radcliffe transit circle at 11h. 19m. G.M.T., his attention was directed to a nebulous object about eight degrees from the zenith. "It was small, but bright and well defined, elliptic in form (major axis 2°, minor axis 1°·5), and situated about half-way between η Ursæ Majoris and α Lyræ, but a few degrees south. The object very much resembled the Præsepe when that cluster is visible in a somewhat hazy sky, an atmospheric condition which prevailed at this time. At first I supposed the object to be a comet, but was soon disillusioned on this point, for in a few minutes its evanescent character was revealed, and, gradually fading, by 11.30 G.M.T. it had entirely disappeared."

The position of the nebulosity was found by means of a star atlas to be

R.A. 16h. 15m.
Decl. + 44°.

The sky was watched until midnight for any return of the phenomenon, but nothing was seen except at about 11h. 42m., when a faint patch of light appeared for a few seconds only, about two degrees east of the above position. The luminosity was apparently not of an auroral nature, and Mr. Robinson suggests that it may have been the trail of a meteor, several instances of meteor clouds of this character having been recorded.

Other observations of the object observed on May 28, if forthcoming, would probably enable a determination to be made of its distance and nature.

A Theory of Volcanoes.—In a forcible exposition of a theory which supposes high-tension terrestrial electricity to be the immediate cause of volcanic eruptions, M. A. Taquin, in the *Revue Scientifique* for June 14, brings together some remarkable observations of the connections between volcanic, solar, magnetic, and terrestrial electrical phenomena. The author provides for the disruptive forces and the heat which attend volcanic actions, by the discharge of this high-tension electricity, and then connects this electricity with the previously observed relations between solar, and terrestrial electrical and magnetic phenomena.

M. Taquin accounts for the remarkably sudden deaths of the inhabitants of St. Pierre by supposing that they were electrocuted, and proceeds to urge, in the following words, the establishment of observatories in volcanic districts:—"I am convinced that the study of the manifestations of terrestrial electricity in such districts will give us the means of foreseeing these volcanic eruptions."

The French Geodetic Mission to the Equator.—Commandant Bourgeois gives an interesting and detailed account of the first year's work of the French geodetic expedition in the *Bulletin de la Société Astronomique* (June, 1902). M. Bourgeois first explains that the *raison d'être* of the mission is "to determine certain elements by which to calculate the dimensions of the earth," and he then proceeds to answer the following self-imposed questions:—(1) What are these elements? (2) How are they to be determined? (3) Why is it necessary to make the observations in a place which is so distant and so difficult to reach? In answering these questions the author describes the inauguration, the organisation, and the journey of the mission to Riobamba, Ecuador, S.A., and also explains why Riobamba was fixed upon as the centre of operations. The whole report, which was communicated to the Société Astronomique, gives an instructive account of the work already achieved, and is illustrated by photographs which give the reader a clear idea of the methods pursued by the mission.

Observations of Nova Persei.—In No. 3796 of the *Astronomische Nachrichten*, Prof. E. E. Barnard gives a brief *résumé* of the various observations of the Nova which were made at Lick subsequent to July, 1901.

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The spectrum of the Nova suggested that it might display the same peculiarity of focus that we find in regard to planetary nebulæ, but a series of observations made between August, 1901, and January, 1902, failed to give any indications of this phenomenon.

The determined position of the Nova with regard to fourteen stars in its immediate vicinity—of which Prof. Barnard gives a chart—agrees fairly well with that already published by Prof. Aitken (Lick Observatory *Bulletin*, No. 8), and a comparison of the two sets of observations confirms no real motion of the Nova.

The observations of brightness, which extend from July 30, 1901, to April 15, 1902, show a gradual decrease in the magnitude of the Nova, with occasional brightenings in which, however, there appears to be no definite periodicity. After special measurements, Prof. Barnard disagrees with the Potsdam magnitude of the reference star B.D. 43° 270 and uses his own estimated value, which is about 0·2m. fainter than that of Potsdam, *i.e.* it is 7·56m.

Careful observations with the great telescope have failed to reveal, visually, the nebulosity surrounding the Nova, the light of which is probably mainly photographic, nor has Prof. Barnard been able to discover the 12·0m. star recorded by Prof. Ceraski as being 0·31s. following and 7″ south of the present position of the Nova (*Astronomische Nachrichten*, No. 3755).

NEW VARIABLE STARS.—The two new variables, as given below, are recorded in No. 3796 of the *Astronomische Nachrichten*.

11, 1902, *Lyrae*.—Mr. Stanley Williams reports the variability of the star, the position of which, as measured on various negatives, is 19h. 7m. 37s.·4 +41° 3′·7 (1855); its magnitude ranges from 11·10 to 12·20. Examination of the various records shows that the brightness of this star was approximately the same, in September, in 1899, 1900 and 1901, so that its period is probably exactly one year, or possibly one half-year.

12, 1902, *Pegasi*.—Herr K. Graff reports the variability of the star, the position of which is 22h. 7m. 30s.·15 +14° 4′ 10″·0 (1902), its range of variability being from 8·7m. to 9·4m.

DELAY OF THE MINIMUM OF U CEPHEI.—In No. 3796 of the *Astronomische Nachrichten*, Mr. J. Plassman records a delay of about 2h. 27m. in the minimum of U Cephei, on April 27, after the time of minimum recorded at Münster.

EARTHQUAKE NOTES.

THE seventh and eighth numbers of the new series of publications issued by the Earthquake Commission of the Kaiserlichen Akademie der Wissenschaften in Wien respectively refer to earthquakes which have been noted in certain parts of the Austrian Alps and in the Carpathians. The first of these, by Dr. R. Hoernes, is a register of 208 shocks observed in Styria between the years 1000 and 1870. Many of these disturbances are described in detail, and to each description there is appended a criticism of the various sources from which the author has derived his information. To complete this work, earthquakes which shook Styria, but originated beyond its borders, have to be considered, and, lastly, the districts shaken and the lines along which shocks have been distributed have yet to be determined. In short, what E. Suess has done for lower Austria and H. Hoefer for Carinthia is to be done for Styria. The second publication, by Prof. W. Láska, is an historical account of the earthquakes of Poland. It refers to a period practically identical with that considered by Dr. Hoernes. The author commences by saying that "earthquakes in Poland are rare," but as reference is made to earthquakes of distant countries which were synchronous with observations made in Poland, the description of Galician shocks extends over thirty-six pages. As an example of these references we read that the first earthquake in 1834 occurred on January 23 at 8h. 45m. and was observed in Tarnopol. On the same day there was an earthquake in England, the epicentrum of which was five miles north of Chichester, and it is worthy of note that there was a similar coincidence in 1666. The probability, however, is that if we had before us a register of all the earthquakes of the world, a coincidence might be found for each of the Carpathian records. In the general remarks attached to these registers we find several interesting notes on the emotional effects produced by those who have predicted the occurrence of earthquakes on specified dates. An accidental realisation of a widely published prediction took place on February 27, 1786, with the result that processions were organised and prayers were offered that earthquakes should not only shake Poland, but that a few should be arranged for Prussia.

In November, 1900, Prof. E. Ōdone gave an account in the *Bollettino della Società Sismologica Italiana* (vol. vi.) of forms of apparatus he proposed to introduce into seismometry which did not have the character of pendulums. The object of the first piece of apparatus was to measure the relative motion of two points of ground separated by a short distance. A seismographic arrangement identical with that proposed by Prof. Ōdone was used in Japan in the years 1884 and 1885. It showed that for fourteen earthquakes the relative motion of the heads of two stakes 3 feet from each other varied between 1 mm. and ·08 mm. (*Trans. Seis. Soc.*, vol. xii. pp. 63–66). The second piece of apparatus has the character of a manometer, and in its improved form as now constructed is described in the *Rivista di Fisica* (Pavia), December, 1901. It consists of a chamber about 2 m. in height and holding 200 l. of water, embedded in the foundations of a wall. At the upper and lower ends of this chamber are two passages closed by sheets of iron. On one side these sheets are in contact with the soil in which the foundations are buried and on the other side with the water of the manometer. Should a shock be transmitted through the soil, these metal diaphragms are deflected, with the result that the water from the chamber rises in a small tube 0·85 cm. in diameter, which is attached to the upper end of the manometer. The effect of vibrations due to explosions of powder in mines—in one instance amounting to 10,000 kgr., the apparatus being at a distance of 1 km.—have been studied, and it is seen that the changes of level in the manometric gauge are such as can be easily measured. From this apparatus it is expected to obtain certain direct measurements of earthquake energy, and from a manuscript note attached to the copy of the paper describing the same it is also anticipated that it may record volcanic sounds.

STATISTICAL METHODS IN BIOLOGY.

THE third part of *Biometrika*, published in April, contains several important contributions, the first of which is by Prof. Karl Pearson, who describes "a systematic method of curve-fitting by moments." For practical purposes it is found that if good quadrature formulæ are used this method is as good as the well-known method of least squares, and in some cases is applicable where the older method fails. Examples of the application of the new method are given. A communication on the sources of apparent polymorphism in plants comprises an editorial introduction and four papers by Messrs. G. Udny Yule, W. L. Tower, Dr. Alice Lee and Prof. Karl Pearson, and Mr. Yule respectively. Those who have considered the "multimodal" character of many botanical distributions as furnishing evidence of the existence of subspecies or local races will find reasons for reconsidering their views in these papers. In this part also Prof. Pearson contributes a controversial paper under the title "On the Fundamental Conceptions of Biology," in which he deals with discontinuity, differentiation and variation, and replies to Mr. Bateson's criticism of his memoir on the principle of homotyposis published in the *Philosophical Transactions* (vol. cxcvii. pp. 285–379). Another controversial paper by Prof. Weldon deals with Prof. De Vries's first volume on the theory of the mutation of species ("Die Mutationstheorie," &c., Bd. 1, 1901). The facts adduced by De Vries in favour of this intermittent and apparently anomalous mode of evolution are considered by Prof. Weldon to be inconclusive, and he comes to the conclusion that the evidence is insufficient to warrant the acceptance of this theory in preference to the selection theory of Darwin.

Among other contributions we may call attention to Mr. Blanchard's paper on "grandparental inheritance," in which he emphasises the need for further experimental work on "blending" as distinguished from "alternative" inheritance, and suggests for this purpose insects and some of the smaller mammals. Miss Lewenz publishes the completion of an investigation first started by Miss Whiteley and Prof. Pearson on the variation and correlation of the bones of the hand in woman. The conclusion is suggested "that if efficiency depends on high correlation, it is not to external measurements of the skull that

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